FEASIBILITY STUDY

NC 209
from NC 63 in Trust
to US 25-70 in Hot Springs
Madison County

Division 13

R-2589

Prepared by the
Program Development Branch
Division of Highways
N. C. Department of Transportation

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I. General Description

This feasibility study describes widening NC 209 from NC 63 in Trust to US 25-70 in Hot Springs, a distance of 14.8 miles (23.8 km). The project location is shown on Figure 1. The recommended cross-section is a two-lane shoulder section, 24 feet (7.3 m) wide on 60 feet (18.3 m) of right-of-way with no access control. It is not anticipated that any residences or businesses will be relocated due to this project. The total cost of the project, including construction and right-of-way, is estimated to be $9,700,000.

This study is the initial step in the planning and design process for this project and is not the product of exhaustive environmental or design investigations. The purpose of this study is to describe the proposed project including costs, and to identify potential problems that may require consideration in the planning and design phases.

II. Need for Project

The purpose of this project is to improve the safety features of this mountainous roadway. This project is supported by the Madison County Chamber of Commerce.

NC 209 is designated as a major rural collector in the North Carolina Statewide Functional Classification System.

NC 209 is currently a two-lane roadway with a pavement width varying bewteen of 18 and 24 feet (5.5-7.3 m) with soil shoulders of various widths. From US 25-70 to Bridge No. 122 south of Hot Springs, the roadway has been recently resurfaced and sidewalks have been installed. It is not anticipated that this portion of the project will require upgrading.

Available shoulder widths vary greatly within the project limits. South of the Bluff community, the roadway follows the Spring Creek floodplain. The soil shoulders along this portion of the project range in width from 4 to 10 feet (1.2-3.0 m). North of Bluff, the roadway is extremely mountainous, and there are numerous vertical alignment problems along this section. The soil shoulders along this portion of the project range in width from 1 to 4 feet (0.3-1.2 m). The

shoulders in this section are typically characterized by sheer rock faces or by steep drops protected by guardrail.

Development along the project is a combination of single family residences and national forest property. A portion of this project is within the Pisgah National Forest, which includes a recreational campground facility and several hiking trails that cross the roadway.

The following table identifies the existing bridges within the project limits:

Table 1. Bridge Data

Bridge Number	*Crossing*	*Structure Type*	*Structure Length*	*Structure Width*	*Year Built*	*Sufficiency Rating*
49	Spring Creek	Timber	87'	25.3'	1940	46.5
84	Meadow Fork Ck.	Steel Plank	41'	20.3'	1938	61.6
122	Spring Creek	Reinforced Concrete	160'	26.4'	1955	65.4
140	Spring Creek	Reinforced Concrete	162'	28.4'	1955	64.3

TIP Project B-3205 will replace Bridge No. 30 just south of the NC 63 intersection and will not be affected by this project. It is currently scheduled for right-of-way acquisition in August 1998 and for construction in August 1999.

The 1996 Average Daily Traffic (ADT) along NC 209 varies from 400 to 1,300 vehicles per day (vpd). For the design year 2020, the estimated traffic volumes on NC 209 will range between 600 and 2,200 vpd. Truck traffic is estimated to make up six percent of daily traffic.

Currently NC 209 is operating at Level of Service (LOS) D. If no improvements are made, it is projected that the roadway will operate at LOS D in the design year 2020. If NC 209 is widened to a 24-foot (7.3-m) shoulder section, the facility will operate at LOS C in the current year and at LOS D in the design year 2020.

During the three-year period from April 1994 to March 1997, there were 22 accidents reported on NC 209 within the project limits. There were 17 injuries reported as a result of these accidents, including no fatalities. The accident rate along NC 209 within the project limits is 210.53 accidents per 100 million vehicle miles (acc/100mvm). This compares with the 1996 statewide rate of 224.39 acc/100mvm for rural two-lane NC routes.

III. Recommendations

It is recommended to widen NC 209 from NC 63 in Trust to US 25-70 in Hot Springs, a distance of 14.8 miles (23.8 km). The project location is shown on Figure 1. The recommended cross-section is a two-lane shoulder section, 24 feet (7.3 m) wide where possible on 60 feet (18.3 m) of right-of-way with no access control.

The roadway has recently been resurfaced from Bridge No. 122 to US 25-70. No improvements are recommended for this portion of the project.

This alternate does not include costs for major modifications to the existing shoulders nor costs for correcting existing alignment problems.

It is recommended to replace Bridges No. 49 and No. 84 with new structures. These bridges cannot be replaced with culverts since the creeks they cross are designated as trout streams.

It is anticipated that no residences or businesses will be relocated due to the project. The total cost of the project is as follows:

Construction	$	8,800,000
Right-of-way	$	900,000
Total Cost	$	9,700,000

IV. Alternates

A second alternate was considered that involved more extensive improvements. This alternate widens NC 209 and replaces bridges as described in the previous alternate, but it also includes costs for major shoulder modifications and realignment of the roadway at the most hazardous curves. The shoulder modifications include reconstruction of eroded shoulders and excavation of sheer rock faces immediately adjacent to the roadway. The target width for widening the shoulders under this alternate is 4 feet (1.2 m).

Due to the mountainous nature of the region, realignments of the roadway in several of the hazardous curves will involve using structures to span large gaps. This option will require five bridges, ranging in length from 200 to 500 feet (61.0-152.4 m).

It is anticipated that no residences or businesses will be relocated due to this alternate. The total cost of the project under this alternate is as follows:

Construction	$ 15,500,000
Right-of-way	$ 800,000
Total Cost	$ 16,300,000

V. Additional Comments

An environmental screening was not conducted for this study. However, no impacts to historic properties or wetlands are anticipated.

Based on maps at the Department of Environment, Health & Natural Resources - Natural Heritage Section, several candidates for protection as threatened/endangered species were identified within and adjacent to the project corridor. The following plants, animals, and habitats were identified:

Adlumia fungosa (Climbing Fungitory)
Stizostedion canadense (Sauger)
Percina aurantiaca (Tangerine Darter)
Cheilanthes alabamensis (Alabama Lip-Fern)
Houstonia longifolia var glabra (Granite Dome Bluet)
Percina sciera (Dusky Darter)
Cottus carolinae (Banded Sculpin)
Meehania cordata (Meehania)
Etheostoma vulneratum (Wounded Darter)
Chestnut Oak Forest
Acidic Cover Forest
Rich Cove Forest
Montaine Acidic Cliff

The sections of Spring Creek and Meadow Fork Creek within the project corridor are Class C waterways and are classified as trout streams. These creeks are part of the French Broad River Basin.

No special accommodation for bicycles is recommended on this project.

DIVISION 13	MADISON COUNTY	FIGURE 1

R-2589
NC 209
FROM NC 63 IN TRUST
TO US 25-70 IN HOT SPRINGS

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
PROGRAM DEVELOPMENT BRANCH

LEGEND

PROPOSED TWO-LANE IMPROVEMENTS